



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

MA.

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/835,673	04/16/2001	Wolfgang Buchalla	ARE0005	8209

832 7590 05/14/2003

BAKER & DANIELS  
111 E. WAYNE STREET  
SUITE 800  
FORT WAYNE, IN 46802

EXAMINER
----------

WILSON, JOHN J

ART UNIT	PAPER NUMBER
----------	--------------

3732

DATE MAILED: 05/14/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Interview Summary</b>	Application No.	Applicant(s)	
	09/835,673	BUCHALLA ET AL.	
	Examiner	Art Unit	
	John J. Wilson	3732	

All participants (applicant, applicant's representative, PTO personnel):

(1) John J. Wilson. (3) \_\_\_\_\_.

(2) Michael D. Schwartz. (4) \_\_\_\_\_.

Date of Interview: 12 May 2003.

Type: a) ☒ Telephonic b) ☐ Video Conference  
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.  
If Yes, brief description: \_\_\_\_\_.

Claim(s) discussed: 1 and 13.


Identification of prior art discussed: Bianchetti, Meller.

Agreement with respect to the claims f) ☐ was reached. g) ☒ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The attached proposed amendment was discussed as well as the meaning of terminology such as drill head, drill bit and a wavelength operable to produce tooth fluorescence. The proposed amendment would not be entered after final. Applicant will further amend the claim language and submit an amendment, along with a request for a RCE, for further consideration.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

  
John J. Wilson  
Primary Examiner

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

\_\_\_\_\_  
Examiner's signature, if required

## Summary of Record of Interview Requirements

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

### Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

#### Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

#### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Application No. 09/835,673  
Unofficial Amendment dated May 12, 2003  
Reply to Office Action of Feb. 11, 2003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 09/835,673  
Applicant : Wolfgang Bucalla et al.  
Filed : April 16, 2001  
Title : LUMINESCENCE ASSISTED CARIES EXCAVATION  
  
TC/A.U. : 3732  
Examiner : John J. Wilson  
  
Docket No. : ARE0005

Honorable Commissioner of Patents  
Washington, D.C. 20231

UNOFFICIAL PROPOSED AMENDMENT AFTER FINAL

Sir:

In response to the Office Action of February 11, 2003, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 10 of this paper.

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (currently amended): A dental handpiece comprising:

a housing;

a drill head bit protruding from said housing, said drill head bit operably connected to a motor mounted in said housing; and

a light source mounted in said housing, said light source operable to produce a light through an opening in said housing, said opening being located in said housing such that said light produced by said light source is projected substantially in a direction along which said drill head protrudes from said housing, said light having a desired wavelength operable to produce tooth luminescence.

Claim 2 (original): The dental handpiece of Claim 1, further comprising:

a fiber optic bundle connecting said light source to said opening.

Claim 3 (original): The dental handpiece of Claim 1, further comprising:

a glass rod assembly connecting said light source to said opening.

Claim 4 (original): The dental handpiece of Claim 1, wherein said light produced by said light source has a wavelength in the blue-violet region of the visible spectrum.

Claim 5 (original): The dental handpiece of Claim 1, wherein said light produced by said light source has a wavelength of 405 nm.

Claim 6 (original): The dental handpiece of Claim 1, wherein said light source comprises a filament lamp having a filterglass bulb.

Claim 7 (original): The dental handpiece of Claim 1, wherein said light source comprises a semiconductor device.

Claim 8 (original): A dental handpiece comprising:

a housing;

excavation means for excavating a portion of carious material occupying a portion of a tooth;

illumination means for emitting a light of a desired wavelength operable to produce tooth luminescence, said illumination means mounted in said housing; and

guide means for guiding an emitted light from said illumination means to an opening in said housing, said opening being located in said housing such that said emitted light is projected onto said tooth when said excavation means is operably positioned for excavating said portion of carious material.

Claim 9 (original): The dental handpiece of Claim 8, wherein said excavation means comprises a drill head protruding from said housing and operably connected to a motor mounted in said housing.

Claim 10 (original): The dental handpiece of Claim 8, wherein said illumination means comprises a filament lamp with a filterglass bulb having a cutoff wavelength whereby said emitted light is in the blue-violet region of the spectrum.

Claim 11 (original): The dental handpiece of Claim 8, wherein said illumination means comprises a semiconductor device.

Claim 12 (original): The dental handpiece of Claim 11 where said emitted light has a wavelength of 405 nm.

Claim 13 (original): An apparatus for facilitating removal of a carious region occupying a portion of an enamel layer and a dentin layer of a tooth, comprising:

a dental handpiece, comprising:

a housing;

a drill head protruding from said housing, said drill head operably connected to a motor mounted in said housing; and

a light source mounted in said housing, said light source operable to produce a light through an opening in said housing, said opening being located in said housing such that said light produced by said light source is projected substantially in a direction along which said drill head protrudes from said housing, said light having a desired wavelength operable to produce tooth fluorescence;

filter means for filtering a luminescence of said tooth caused by said light produced by said light source, said filter means having a cutoff

wavelength whereby said light produced by said light source cannot traverse said filter means.

Claim 14 (original): The apparatus of Claim 13, wherein said cutoff wavelength of said filter comprises 500 nm, whereby only light having a wavelength greater than or equal to 500 nm traverses said filter means.

Claim 15 (original): A method of identifying a caries in a tooth, comprising:  
    projecting a light of a desired wavelength onto the tooth, said light causing a luminescence of the tooth;  
    observing the luminescence of the tooth;  
    identifying a red-orange central region surrounded by an intensely luminescent region and a dark outer ring, whereby the intensely luminescent region is intermediate the red-orange central region and the dark outer ring; and  
    recognizing the red-orange central region as a bacterially invaded region.

Claim 16 (original): The method of Claim 15, wherein said intensely luminescent region intermediate the red-orange central region and the dark outer ring comprises a green region.

Claim 17 (original): The method of Claim 15, wherein said step of observing the luminescent emission comprises placing a filter intermediate the tooth and an eye of an observer, and observing the luminescent emission through the filter.

Claim 18 (original): The method of Claim 15, further comprising:



identifying the dentin layer of the tooth, the dentin layer comprising a luminescent region outside the dark outer ring, the dentin layer being less intensely luminescent than the intensely luminescent region, whereby the dentin layer appears yellow-green.

Claim 19 (original): The method of Claim 18, further comprising:

identifying the enamel layer of the tooth, the enamel layer comprising an area beyond the luminescent region comprising the dentin layer of the tooth, the enamel layer being less luminescent than the dentin layer.

Claim 20 (original): The method of Claim 17, wherein said filter comprises a high-pass filter having a cutoff wavelength in the green region of the visible spectrum.

Claim 21 (original): The method of Claim 15, wherein said desired wavelength comprises 405 nm.

Claim 22 (original): A method of excavating carious material in a tooth, comprising:

providing a dental handpiece having a housing, and a drill head protruding from the housing, the drill head being operably connected to a motor mounted in the housing, the dental handpiece further including a light source mounted in the housing and being operable to produce a light through an opening in the housing, the opening being located in the housing such that the light produced by the light source is projected substantially in a direction along which the drill head protrudes from the housing, said light having a desired wavelength operable to produce tooth luminescence;

activating the light source to produce said light;

positioning the dental handpiece to project said light onto the tooth, said light causing a luminescence of the tooth;

observing the luminescence of the tooth and thereby identifying the carious material;

actuating the drill head; and

applying the drill head to the carious material.

Claim 23 (original): The method of Claim 22, wherein said desired wavelength comprises 405 nm.

Claim 24 (original): The method of Claim 22, wherein said step of observing the luminescence of the tooth and thereby identifying the carious material comprises the steps of:

identifying a red-orange central region surrounded by an intensely luminescent yellow-green region and a dark outer ring, whereby the intensely luminescent region is intermediate the red-orange central region and the dark outer ring; and  
recognizing the red-orange central region as a bacterially invaded zone.

Claim 25 (original): The method of Claim 24, wherein said step of observing the luminescence of the tooth and thereby identifying the carious material further comprises the steps of:

placing a filter intermediate the tooth and an eye of an observer; and  
observing the luminescence of the tooth through the filter.

Claim 26 (original): The method of Claim 24, further comprising:

identifying a dentin layer of the tooth, the dentin layer comprising a luminescent region outside the dark outer ring, the dentin layer being less intensely luminescent than the intensely luminescent region, whereby the dentin layer appears yellow-green.

Claim 27 (original): The method of Claim 26, further comprising:

identifying an enamel layer of the tooth, the enamel layer comprising an area beyond the luminescent region comprising the dentin layer of the tooth, the enamel layer being less luminescent than the dentin layer.

Claim 28 (original): A method of excavating carious material in a tooth, comprising:

providing a dental handpiece having: a housing; excavation means for excavating a portion of carious material occupying a portion of the tooth, said excavation means integral with said dental handpiece; illumination means for emitting a light of a desired wavelength operable to produce tooth luminescence, said illumination means mounted in said housing; and guide means for guiding an emitted light from said illumination means to an opening in said housing, said opening being located in said housing such that said emitted light is projected onto said tooth when said excavation means is operably positioned for excavating said portion of carious material;

activating the illumination means to produce said light;

positioning the dental handpiece to project said light onto the tooth, said light causing a luminescence of the tooth;

observing the luminescence of the tooth and thereby identifying the carious material;

actuating the excavation means; and

applying the excavation means to the carious material.

Claim 29 (original): The method of Claim 28, wherein said step of observing the luminescence of the tooth and thereby identifying the carious material comprises the steps of:

identifying a red-orange central region surrounded by an intensely luminescent yellow-green region and a dark outer ring, whereby the intensely luminescent region is intermediate the red-orange central region and the dark outer ring; and

recognizing the red-orange central region as a bacterially invaded zone.

Application No. 09/835,673  
Unofficial Amendment dated May 12, 2003  
Reply to Office Action of Feb. 11, 2003

Claim 30 (original): The method of Claim 29, wherein said step of observing the luminescence of the tooth and thereby identifying the carious material further comprises the steps of:

placing a filter intermediate the tooth and an eye of an observer; and  
observing the luminescence of the tooth through the filter.

**REMARKS**

Claims 1-30 are pending in the application. The Examiner has rejected Claims 1-14 and allowed Claims 15-30.

**Claim Rejections – 35 U.S.C. §102**

The Examiner has maintained the rejection of Claims 1, 2, 7-9 and 11 under 35 U.S.C. §102(e) as being anticipated by Bianchetti (U.S. Patent No. 6,095,810). In the Amendment of January 10, 2003, Applicants requested withdrawal of the 35 U.S.C. §102(e) rejection of Claims 1, 2, 7-9, and 11 because Bianchetti '810 did not disclose the drill head of Claims 1, 2, and 7; or the excavation means of Claims 8, 9, and 11.

The Examiner disagreed with Applicants' argument with respect to Bianchetti '810 because 1) "[N]o drill is being claimed, only a head. To call the head a 'drill' head is merely terminology and/or intended use which is given no patentable weight" (Office Action dated February 11, 2003, page 4, lines 11-13); and 2) because the Examiner contended that vibrating workpieces can be used to drill and evacuate. Applicants respectfully disagree with both of these contentions and submit that Claims 1, 2, 7-9, and 11 are patentable over Bianchetti '810 for the reasons advanced in Applicants' Amendment of January 10, 2003.

Responsive to the Examiner's first contention that the "drill head" called for in Independent Claim 1 and Claims 2, and 7 depending therefrom is merely an intended use and no drill is being claimed, Applicants respectfully direct the Examiner's attention to lines 8 and 9 of paragraph [0012] of the present specification wherein Applicants specifically identify "drill head" as "the operable end of an oscillating or rotating drill bit utilized to effect caries excavation." (emphasis added) Notwithstanding this definition of "drill head" contained in the patent specification, Applicants have amended Claim 1 to further clarify that a drill bit is claimed in Independent Claim 1. Because Bianchetti '810 does not disclose a drill bit as called for in Independent Claim 1, Applicants respectfully submit that Independent Claim 1 and Claims 2 and 7 depending therefrom are patentable over the cited reference to Bianchetti and respectfully

request withdrawal of the 35 U.S.C. §102(e) rejection of these claims over Bianchetti '810.

Responsive to the Examiner's second contention, i.e., that vibrating workpieces can be used to drill and excavate, Applicants respectfully submit that the entire disclosure of Bianchetti '810 makes clear that the workpiece disclosed therein is utilized only to remove tartar and plaque from the tooth surface. See U.S. Patent No. 6,095,810, Abstract ("A workpiece (10) which effect removal of tartar and plaque from the tooth *surface*"); column 1, lines 9-11 ("The invention refers in particular to a surgical instrument employed by dentists for scaling and removing tartar and plaque from the tooth *surface*"); column 1, lines 20-23, column 2, lines 59-61 ("Plaque is a deposit of bacteria that forms through lack of hygiene or disease of the oral cavity; if it is not removed plaque creates the formation of tartar which is a calculus that forms on the tooth *surface*...hooked workpiece 10, which by entering into vibration, carries out removal of the tartar and plaque from the patient's teeth.") (Emphasis added). Furthermore, Applicants respectfully direct the Examiner's attention to the enclosed Declaration under 37 C.F.R. §1.132 which indicates in paragraph \_\_\_\_\_ thereof that the workpiece of Bianchetti '810 while possibly being capable of scratching or roughening the surface of a tooth would be incapable of drilling into the tooth and excavating carious tooth substance as would the drill bit of Independent Claim 1 and the excavation means of Independent Claim 8. Because Bianchetti '801 does not disclose a drill bit or an excavation means as called for in Independent Claims 1 and 8, and Claims 2, 7, 9, and 11 depending therefrom, Applicants respectfully request withdrawal of the 35 U.S.C. §102(e) rejection of these claims over Bianchetti '810.

**Claim Rejections – 35 U.S.C. §103**

The Examiner maintained his rejection of Claims 3-6, 10, and 12 under 35 U.S.C. §103 as being unpatentable over Bianchetti '810 either alone or in combination with a secondary reference. Responsive to the rejection of Claims 3-6, 10, and 12, Applicants respectfully submit that Bianchetti '810 does not disclose or suggest the drill bit or excavation means of Independent Claims 1 and 8 and therefore respectfully request withdrawal of the 35 U.S.C. 103 rejection of Claims 3-6, 10, and 12 which all depend from one of Independent Claims 1 and 8.

Application No. 09/835,673  
Unofficial Amendment dated May 12, 2003  
Reply to Office Action of Feb. 11, 2003

The Examiner further maintained his rejection of Claims 13 and 14 under 35 U.S.C. §103 as being unpatentable over Meller (U.S. Patent No. 4,642,738) in view of Lafond (EP 0113152). Responsive to Applicants' argument in the Amendment dated January 10, 2003 that there is no motivation to combine Meller '738 and Lafond '152, the Examiner indicated that as stated in his previous rejection, the elements were merely listed together and that a list of prior art showing the same claimed structure properly meets a list of different structures in a claim. Without conceding that the Examiner's position with respect to elements listed together is correct, Applicants respectfully submit that Meller '738 does not disclose a light source having a wavelength operable to produce tooth luminescence mounted in a dental handpiece housing and therefore merely combining the filter of Lafond '152 with the handpiece of Meller '738 does not yield the claimed invention of Applicants Claims 13 and 14. Therefore, applicants respectfully request withdrawal of the 35 U.S.C. §103 rejection of Claims 13 and 14 over Meller '738 in view of Lafond '152.

Applicant appreciates the Examiner's courtesy in considering this Unofficial Response and scheduling a telephone interview to discuss same.